ABSTRACT OF THE INVENTION

A system and method for enhancing the flux and separation properties of water filtration membranes by oxidizing raw or processed water constituents with direct photolysis of the water matrix by pulsed blackbody UV, yielding ozone and hydrogen peroxide, hydroxyl radicals and other short lived oxidizing species. The result thereof, causing precipitation of inorganic molecules or organically complexed minerals, partial or complete mineralization of organic molecules and the deactivation or destruction of microbes including: virus, bacteria and protozoa. The system and method comprises a pulsed blackbody, deep-UV reactor having at least one treatment chamber, the reactor having a conveying assembly to convey the water to be treated into the chamber; a filter assembly to screen the UV treated water; a caustic supply means for the post-treatment of water; a recovering assembly recovering the permeate at an outlet of the filtration means. The effect of such UV water treatment is multifaceted. One aspect is the reduction of the transmembrane pressure (TMP), another is the reduction of duration of backwash and caustic cleaning cycles. Also, the oxidation of iron and manganese to insoluble compounds, without the addition of oxidizing agents, does not harm the membranes. Iron and manganese turn into hydroxide crystals trapped by the filtration membrane and separated from the permeate. These effects integrate to enhance the water flux through the filter membrane.

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